

1996 CENTENARY COLLEGE

"DALLAS YELLOTT"

STUDENT RESEARCH FORUM

APRIL 19, 1996

Judges:

Dr. Ken Aizawa

Dr. Joyce Johnson

Dr. Rosemary Seidler

A New Expressionism: German Expressionists
Austrian Secessionists and Their Influence
On the Artwork of Amy Long

*Amy Long
Art Department

The German Expressionists and the Austrian Secessionists broke new ground and startled the public with their exploration of inner feelings through bright color and bold brushstroke. As an artist eighty years later, I am influenced strongly by these artists. Through my art I explore human relationships, internal conflict, and the human will. In this short presentation I will compare my own art with these turn-of-the-century artists, and discuss a "new Expressionism" of the late twentieth century.

From the River Flows . . .
A Structural and Thematic Analysis
of Ovid's Metamorphoses 8.547-884

*ANNETTE STEWART

Department of Foreign Languages, Humanities Div.

This paper examines the final third of book 8 of Ovid's Metamorphoses. Within this section are a number of mythological stories which involve metamorphosis of some kind. Analysis of theme, narrative structure, and verbal echoes reveals that awareness of these relationships is important for interpretation. In particular, this study focuses on the arrangement of antithetical and parallel themes which run throughout this portion of the Metamorphoses.

How Violence in Sports is Affecting Our Children

*MICHAEL LOVE

English Department, Communication Division

The affects of watching violence in sports
are disturbing. Children commit acts of violence
from watching their sports heroes.

How Women Are Portrayed In The Advertising World

*Kimberly Vetter

Department of English, Communication Division

Advertisements are magnificent accumulations of material about the shared experiences and feelings of an entire society. Advertisements seek, in every way, to standardize everything into a common global mode. Social trends appear in advertisements as a series of people acting in increasingly common ways. These social trends, pictured in advertisements, reveal how the American society views the roles in which men and women play. Throughout time these social trends and views have changed and will continue to change for a number of reasons. As Harvard Magazine states, "One function of advertisements is to reinforce the way our society is used to doing things. Advertisements adapt to change and encourage change" (McKibben, Bill)

Subversion of the Patriarchy in *Romeo and Juliet*

*KATRINA BLODGETT

English Department, Humanities Division

In *Romeo and Juliet*, the playwright explores the patriarchy as a system only to put it on its head through gender role reversals. Textual evidence throughout the play establishes Juliet as the dominant, or "male," half of the relationship. Her adoption of strong, aggressive characteristics (and Romeo's parallel sentimentality and weakness) continue into her death and beyond. For the purposes of this short presentation of a longer work, I will focus mainly on the marriage of Romeo and Juliet and their double suicide.

Social Research in the Field of Fashion Modeling.

***DEBORAH OXNER, DR. MARK FISCH**

Department of Sociology

By gathering information on various variables and concepts, I will explore the local profession of fashion modeling. Presently, I am still gathering information. Some possible hypotheses may include: Does modeling increase self esteem? Does it increase competitiveness? Do models rely on their looks versus their brains and personality? Does modeling cause eating disorders? Is harassment prevalent in this field? The importance of the study is to make people more aware of what is involved in this profession.

Historical Economic Perspective of Labor Strikes in Baseball

***KATHRYN BOOTS, HAROLD CHRISTENSEN, ELIZABETH RANKIN**

Frost School of Business, Department of Economics

This paper focuses on the labor strikes of organized professional baseball starting from the first strike in 1972 to the 1994-95 lockout. The paper examines the labor disputes between owners, players, umpires and the league. In all cases, players and umpires have been represented by their elected bargaining agents, The Major League Baseball Players Association and the Major League Umpires Association respectively.

Labor relations is the focus of the paper documenting the various work stoppages. Actions on all sides of the issues are analyzed as to the effect on labor relations as well as economic issues and implications. The events will be analyzed to determine if there is a relationship between the work stoppages. The hypothesis of the research is that there are correlating trends in the issues behind the work stoppages.

A Statistical Analysis of Centenary College's Ability to Retain Students

*NICK MCKINNEY and DR. ELIZABETH L. RANKIN

Department of Economics, Social Science Division

Like all colleges and universities, Centenary College provides a service to consumers (the students). The ability of the college to retain and graduate those students is a major key to its success. Through the use of the binomial logit and probit forms of linear regression, and data obtained from the Centenary College administration, this paper will analyze the College's student retention ratio. The study includes fall semester freshmen student entrants to Centenary College. The data represents cohorts from 1990-1994. The dependent variable is a dummy variable that indicates whether a student dropped out or graduated (or is still attending Centenary when the case permits). The independent variables include: gender, race, GPA, ACT or SAT scores, Varsity athletics, Louisiana residency, Fraternity or Sorority involvement, financial aid and campus or off campus residency. All variables will be tested for significance, and omitted or adjusted as necessary. The results will predict those variables most important in the retention process at Centenary.

Effective Variables on Marriage Termination.

*SARAH VALIGA

Department of Economics, Social Science Division

Marriage creates a union of economic and interpersonal assets between two individuals. Divorce is the dissolution of these assets. Therefore, the decision to become divorce should be linked to the expected financial consequences of both parties by the distribution of those assets.

This study uses econometric multiple regression techniques in order to analyze the socioeconomic factors affecting the divorce rate for the year 1991. A cross-section of the 50 states is examined. The examined variables studied include: AFDC benefits, catholic religion, college graduation, females participating in the workforce, marriage rates, per capita income, the service sector, and the Caucasian race.

The research produces results through a correlation between the increased divorce rate and positive financial consequences. In economic terms, a high level of human capital held by an individual will lower their opportunity cost of divorce.

Business and Economic Relationships Between The United States
and its Major Trading Partners.

*WARREN AW

Department of Business, Business Division

The United States' direct investment abroad, and foreign direct investment in the U.S will be analyzed according to the respective countries and their industries, for year end 1994. After this analysis, the top three countries or areas with large investments in the U.S as well as the U.S having large investments in those areas will be selected. These places will then be determined as the United States' major trading partners. It so happens that these areas/countries are the European Union, Japan and Canada (with a brief reference to the North American Free Trade Agreement). A historical approach will then be used to trace the business and economic relations between the U.S and its major trading partners. That is, what have been done, negotiated, and put in force to either ease, step up or slow down trade relations between the U.S and those three areas mentioned above.

The Effect of Superior Customer Value on Competitive Advantage in Consumer Markets

*CHRISTAN WEIDNER, HANS RASK JENSEN, and DR. DON WILCOX

Frost School of Business, Business Division

During my studies at the Aarhus School of Business in Aarhus, Denmark, I researched consumer behavior: the relationship between customer value and competitive advantage, under the supervision of Professor Jensen. The following is a synopsis of our findings.

Through our research, we found that competitive advantage can be sustained through superior customer value. Many marketers regard superior customer value as a basic business strategy. This strategy will yield competitive advantage and can be sustained if customers are both attracted and kept. To achieve this, the customer's perceived value of the product must always exceed the value of any alternative. To sustain competitive advantage, marketing strategies must be in place to promote superior customer value. The agenda of strategic management is the key to the success of the firm's marketing strategies, customer value, and competitive advantage.

Corporate Earnings/Corporate Earnings Growth and Institutional Ownership

BARBARA BROWN, RACHEL MCGEE,
DR. BARBARA DAVIS, and DR. HELEN MASON.

Frost School of Business

Our study examines the relationship between corporate earnings/corporate earnings growth and the level of institutional ownership in publicly-held companies. The sample includes 43,000 observations of publicly-held firms for a seven year period, 1988-1994. Multiple regression analysis identifies significant relationships. The ownership mix is seen more in the smaller firms than in the larger firms because of the relationship between management and ownership. In smaller firms, the CEO may also be the President/Manager/Owner. In larger firms, a more complex structure does not permit the mixing of duties. The results of our study confirm previous studies that have been done.

The Relationship Between Insiders, Earnings Growth and Stock Splits

DR. BARBARA DAVIS, DR. HELEN MASON,
SAMANTHA CRAGER*, AND PEYTON LABORDE

Frost School of Business

The study estimates the relationship between insider stock ownership, earnings growth and the stock split behavior of firms. The study is a two-group design: firms approving stock splits and those that do not enact stock splits. The study group includes approximately 6000 publicly traded firms per year for seven years, 1988-1994. Analysis of Covariance estimates the relationship. The study contributes to the literature because no study, to date addresses this relationship.

Remember When.....

Choreographed by Alicia Billiot

Performed by: Trena Blodgett, LeVette Fuller, Angela Jones, Katie Sigler,
Heidi Tate, Jennifer Taylor, Gina Thomas, Amy Wallis, Shay Zeller

Department of Theater, Dance Division

This piece was a research project on the influence of teachers in students lives. The dancers shared their stories and reflections. From the mass collection of over two and a half hours of stories, several were chosen and woven together to form the script. The stories chosen were selected because they reflected universal themes present throughout the story collection. These stories became the basis for the script, costumes, music and the movement itself.

**Preparation of Electrorefiner Samples
for Thermal Ionization Mass Spectrometry
by Extraction Chromatography**

***J. A. MORGAN, S. M. FRANK, S. G. JOHNSON**

Engineering Division

Argonne National Laboratory-West

PO Box 2528

Idaho Falls, Idaho 83405-2528

Abstract

In support of the Electrorefiner (ER) process at ANL-W, separation of uranium from ER samples containing fission products is necessary to reduce the activity level of the sample before uranium analysis by Thermal Ionization Mass Spectrometry (TIMS). The concentration of uranium in the samples is evaluated for process monitoring and nuclear material accountability. Previously, a hexone extraction method was used, which, despite being very effective, generated mixed hazardous waste and was highly labor intensive. This work involves the use of U/TEVA ion selective resin produced by EiChroM Industries, Darien, Illinois. With the U/TEVA resin, uranium is retained on the column under high nitric acid concentrations while the dissolved sample matrix and fission products are rinsed from the column. Uranium is then eluted under dilute nitric acid conditions and can be loaded onto a filament for uranium analysis by TIMS. This process, which generates no mixed hazardous waste and is sufficiently accurate and precise for accountability purposes, is effective for a variety of ER samples including eutectic salt, cadmium, and metallic fuel. Also, fewer steps are involved, making this method highly suitable for hot cell and glove box applications.

Unimolecular Dissociation of Dioxetanes

***BRANDON YOUNG and DR. TOM TICICH**

Department of Chemistry, Natural Science Division

The unimolecular rate constant of the dissociation of dioxetane molecules was taken using an ultra-violet laser beam produced by a Nd:YAG pumped dye laser. The laser pulse excites the dioxetanes to an excited vibrational state which causes the dioxetane to decompose. This high vibrational state corresponds to the higher electronic state of the decomposition products, acetone and acetaldehyde. The products release this energy through chemiluminescence. This is measured to determine the rate at which the dioxetane dissociates into its excited state products.

Induction of Nitric Oxide Synthase in Rat Astroglia.

*DONALD PEARSON RITCHIE Department of Biology, Centenary College
and JUDSON CHANDLER, Ph. D. Department of Pharmacology, Louisiana
State University Medical School

The expression (detection of elevated iNOS mRNA levels) of an inducible form of nitric oxide synthase (iNOS) was examined using reverse transcriptase-*in situ*-polymerase chain reaction (RT-*in situ*-PCR) in rat astroglial cells. Preliminary work involved establishing reaction conditions for the *in situ* PCR using conventional PCR. These included a positive control employing mouse iNOS sequence and experimental cDNA's derived from the RT reactions performed on total RNA isolated from a RAW macrophage cell line and cultured astroglial cells. These cDNA's were used to test iNOS specific primers using conventional tube PCR. Upon obtaining satisfactory results with the conventional PCR, slides of primary cultures of rat astroglia were used to induce NOS in the tissue. Preliminary RT *in situ* PCR analysis yielded inconclusive data. Possible reasons for this are discussed

Molecular Cloning of the *Brucella abortus* Iron Uptake Regulation (*fur*) Gene. M.A. FARRIS^{1*}, R.W. PHILLIPS¹, M.E. KOVACH¹, D.J. SEASTONE¹, D.D. NORTON¹, P.H. ELZER², C.L. BALDWIN³, R.M. ROOP¹. Louisiana State University Medical Center, Shreveport, LA 71130-3932, Louisiana State University, Baton Rouge, LA 70803, and University of Massachusetts, Amherst, MA 01003

The *Escherichia coli fur* mutant H1780 was transformed with *Brucella abortus* genomic DNA fragments cloned into the *Bam*HI site of pUC 9. A recombinant plasmid pDS1 restored the ability of H1780 to repress expression of an iron-inducible (*fiu*)-*lacZ* operon fusion on iron supplemented MacConkey agar plates. Restriction enzyme analysis of pDS1 revealed that the plasmid contained a 1.7 kilobase insert; that was subcloned as a 900 basepair fragment into the *Hind* III site of pUC9. The recombinant plasmid pDS1.1 also represses the expression of the *fiu-lacZ* operon fusion on iron supplemented MacConkey agar. Nucleotide sequence analysis of pDS1 identified an open reading frame encoding a protein showing > 40% amino acid identity with the *E. coli* Fur protein. Fur is a transcriptional repressor which down-regulates the expression of genes involved in iron acquisition and utilization when adequate levels of iron are present in the environment. An assay for β -galactosidase activity was performed on H1780 containing the following plasmids: pDS1, pDS1.1, pMAF2, and pUC19, to determine the extent of expression of the *fiu-lacZ* operon. These assays revealed that H1780, pMAF2, and pUC19 have a high level of β -galactosidase activity, while pDS1 and pDS1.1 produce the lowest β -galactosidase activity. These data indicate that the *Brucella* Fur homolog functions as a transcriptional repressor which is sensitive to environmental iron levels, suggesting it shares a similar biological function with its *E. coli* counterpart

The Effects Of Alcohol On The Development Of B Lymphocytes In Adult C57Bl/6 Mice.

STEPHEN CANNON, KRISTEN BIBER & DR. MICHAEL WOLCOTT.

Department of Microbiology and Immunology, Louisiana State University Medical Center, Shreveport

B-cells pass through five stages of development, termed fractions A, B, C, D, E, and F. Each stage is marked by the expression of different surface markers and growth capabilities. Fractions A-C or the Pro-B cells, and D, the pre-B-cells are found primarily in the hemopoietic tissue of the bone marrow, while immature and mature fractions are found in circulation and thus in the spleen.

Animals were assigned to one of three experimental groups, chow fed, pair fed control, and ethanol supplemented diet. After one week of feeding, spleen and bone marrow cells were harvested from all animals and cultured for seven weeks *in vitro*. B-cells still viable after this period were subjected to various analyses to determine their ontogenetic status. The ontogeny of B-cell population viability in the bone marrow was determined using clonal proliferation, lipopolysaccharide (LPS) ELISA assay, and limiting dilution analysis. B-cell activity in the spleen was measured using (LPS) analysis alone.

We expect results from this experiment to reflect that found earlier in a fetal model (Wolcott et al., {1995} Alcohol. Clin. Exp. Res. 19: 170-176).

Optical Properties of Organic Molecules at Elevated Temperatures

VALERIE ZABEL*, JOEL BLAKENEY, ELTON GRAUGNARD,
and JUAN RODRIGUEZ

Department of Physics, Science Division

The interest in gas phase spectroscopy of large organic molecules has grown recently due to the growing need to understand their intrinsic behavior vs. their behavior in condensed-phase environments. Here we report on the optical absorption and emission of large organic molecules in the gas phase at elevated temperatures. Our results show that the optical spectra generally red shift and broaden significantly with increasing temperature. The absorption and emission spectra shift at different rates, leading to a growing mismatch (Stoke's shift) with temperature. The profiles of the peaks are well described by loretzians with linewidths on the order of several nanometers.

THEORETICAL AND EXPERIMENTAL FINDINGS OF ORGANIC
MOLECULES; JOEL BLAKENEY*, JUAN RODRIGUEZ
PHYSICS, SCIENCE DIVISION

The purpose of our research was to study the behavior of large, organic molecules at elevated temperatures. Specifically, we investigated how the light absorption and emission properties change with temperature. The experimental evidence for all organic molecules investigated so far indicates that these properties exhibit similar changes with increasing temperature. This experimental result can be simulated by a computer program called HyperChem. A comparison between experimental and theoretical data will be shown.

Vibrational Dynamics of Benzene in an Ultracold Argon Host; ELTON GRAUGNARD, RICHARD HASTY, JASON RING, CRAIG MARTIN, and JUAN RODRIGUEZ; Science Division, Department of Physics.*

The vibrational dynamics of benzene in the gas phase and inside ultracold ($< 1\text{K}$) argon matrices, are studied using a classical molecular dynamics approach. Our studies demonstrate that all intramolecular modes shift to the blue from the gas phase to the condensed phase. The magnitude of the shifts are dependent on the nature of the mode and the structure of the medium. These are typically on the order of a few cm^{-1} , with the most dramatic shift of all (16 cm^{-1}) occurring for the ν_{20} mode in an amorphous argon matrix. In spite of these intermolecular effects, no intramolecular vibrational energy is dissipated from the benzene to the surrounding argon bath within the time scale of our simulations which span up to one nanosecond. The symmetry of some of the intramolecular modes is altered by host perturbation. The sudden stimulus of intramolecular modes is generally followed by chaotic-like cage dynamics with relaxation times on the order of a few picoseconds. These results can be rationalized with a simple analytical model that assumes harmonic potentials for the intramolecular and intermolecular forces.

Mapping Tissue Oxygenation: Preliminary Studies

*ALJAY FOREMAN, JAMES HARVEY, JUAN RODRIGUEZ

Department of Physics and Engineering, Science Division

The aim of the investigation is to develop a method to probe the level of oxygenated hemoglobin in human tissue. We tried to accomplish this feat by using a light emitting diode that would pass through the brain and be detected by a light detector. Because the brain tissue scatters light very strongly, the light source must be strong enough to penetrate and be detected through the skull. The simple infrared light source proved too weak to do this, so alternate methods, such as pulsing the light source, were sought in our experiment.

Mapping Tissue Oxygenation: Building the Detector;

James Harvey*, Aljay Foreman, Juan Rodriguez

PHYSICS, SCIENCE DIVISION

The purpose of our project was to build a sensitive detector, practical in a research or hospital setting, which would detect light in the 700-900 nm range. This wavelength passes through human tissue better than other wavelengths and could be used to detect the amount of oxygenated hemoglobin in human tissue. We will display the finished detector and show measurements made with the detector through human tissue.

A Comparison of Pre- and Post-dam Groundwater
Conditions in the Red River Alluvium, Northwest
Louisiana

*STACEY JORDAN and DR. MARY BARRETT

Department of Geology, Science Division

Lock and Dam No. 5, approximately 20 miles south of Shreveport on the Red River, was completed in January 1995. Data from approximately 100 wells in Caddo and Bossier parishes were used to determine groundwater levels. The U.S. Geological Survey groundwater records are from 1960 to present-day. The raising of the river level from the dam has strongly affected groundwater levels and movement as compared to the pre-dam condition. Post-dam groundwater levels are higher overall. The natural seasonal variations of both river and groundwater highs and lows are greatly reduced. The artificially-high river stages often cause the groundwater to move away from the river, a pattern normally seen only associated with floods.

Novel Synthetic Routes to Bicyclic Compounds from Vinyl Allenes²
*BRENT WAGUESPACK¹ and NEIL ALLISON²

¹Department of Chemistry

Centenary College

Shreveport, LA

²Department of Chemistry

University of Arkansas

Fayetteville, AR

Bicyclic ring systems are of considerable interest in chemistry. Many compounds of pharmacological interest contain these systems, but exploration of their properties is hindered by limitations in the small number of known reactions that lead to their synthesis. One possible route to synthesis of bicyclic ring systems is through the ring closure of vinyl allenes activated by the attachment of a metal. In the course of investigating this potential route, a method was discovered that lead to formation of bicyclic ring systems from vinyl allenes without a requirement for metal activation. This route leads to synthesis of these systems that were previously unattainable through more classical synthetic processes.

This research was performed in the laboratory of Dr. Neil Allison of the Department of Chemistry at the University of Arkansas in Fayetteville and was supported by a National Science Foundation Research Experience for Undergraduates grant.









